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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/391,473	09/08/1999	NOBORU KUBO	4930(840)	8652

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EXAMINER	
WHIPKEY, JASON T	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/391,473	KUBO ET AL.	
	Examiner	Art Unit	
	Jason T. Whipkey	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *4,6 and 9-19* is/are allowed.

6)☒ Claim(s) *1-3,5 and 7* is/are rejected.

7)☒ Claim(s) *8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/18/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-3, 5, and 7 have been considered but are moot in view of the new grounds of rejection.

2. Applicant's arguments (see the last paragraph of page 13 and the first paragraph of page 14) filed August 3, 2004, with respect to claims 1-9 have been fully considered and are persuasive. The rejection of claims 1-9 has been withdrawn. However, upon further consideration, a new ground of rejection for claims 1-3, 5, and 7 is made in view of Levine and Kameyama.

Specification

3. Applicant's amendment to the specification is approved, as it is solely directed to clarifying the original disclosure.

Claim Objections

4. Claims 7 and 8 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to

cancel the claims, amend the claims to place them in proper dependent form, or rewrite the claims in independent form.

Both claims recite two specific amounts of incident light used in the detection of defective pixels. However, claims 1 and 4 — on which claims 7 and 8 depend — have been amended to recite that detection is performed "without requiring specific amounts of incident light." Therefore, it is possible to infringe on dependent claims 7 and 8 without infringing on independent claims 1 and 4, indicating that the dependent claims fail to further limit the independent claims.

See MPEP § 608.01(n).

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levine (U.S. Patent No. 4,253,120) in view of Heller (U.S. Patent No. 6,396,539).

Regarding **claim 1**, Levine discloses a pixel defect detector for a solid-state imaging device (imager 100 in Figure 2), comprising a plurality of photoelectric transducers (picture sampling elements 206), the pixel defect detector comprising:

a calculation section (discrimination means 900 in Figure 9) for obtaining output characteristics of a subject photoelectric transducer (inputted pixel III) for light incident thereupon so as to determine the presence/absence of a defect in the subject photoelectric transducer based on the output characteristics thereof (see column 6, lines 40-44), wherein

an output corresponding to a non-defective photoelectric transducer (the output of averaging circuit 906) is calculated based on outputs from a plurality of photoelectric transducers neighboring the subject photoelectric transducer (pixels II and IV, which correspond to the pixels preceding and following pixel III; see column 7, lines 9-12) for one of the amounts of incident light without requiring specific amounts of incident light (defect detection occurs during the actual use of the camera and not in a special mode; see column 1, lines 54-59), and

the calculated output corresponding to a non-defective transducer is used in determining the presence/absence of a defect in the subject photoelectric transducer (see column 8, lines 6-8).

Levine is silent with regard to applying varied amounts of light in determining whether a defect is present.

Heller discloses an imaging device that detects pixel defects and stores the locations of defects in a memory (see column 7, lines 58-61). Defect detection involves analyzing the output when two different lighting conditions are present (see column 7, line 61, through column 8, line 28).

As stated in column 8, lines 8-17, an advantage to applying different amounts of light is that white and black pixel defects can be detected. For this reason, it would have been obvious at the time of invention to have Levine's defect detection include the use of a plurality of lighting levels, such as described by Heller, as the additional testing would more accurately detect both kinds of pixel flaws.

Regarding **claim 2**, Levine teaches:

> the pixel defect detector further comprises a memory (tapped delay line 800 in Figure 8 stores a number of pixels used in the detection of a pixel defect) for storing an output signal from the photoelectric transducer; and
>
> the calculation section determines the output characteristics of the subject photoelectric transducer using the output signal of the subject photoelectric transducer stored in the memory (column 6, lines 28-37).

Levine is silent with regard to specifically using a memory that can store an entire picture. Official Notice is taken that picture memories are commonly used to hold entire images before image processing. An advantage to using such a memory is that a delay in image processing would not result in the loss of image data. For this reason, it would have been obvious at the time of invention to have Levine's defect detector store image signals in a picture memory prior to processing.

Regarding **claim 3**, Heller discloses:

> the output characteristics of the subject photoelectric transducer are represented by a plurality of output signals of the subject photoelectric transducer in response to different amounts of light incident thereupon, respectively (see column 8, lines 8-17).

Regarding **claim 7**, Heller discloses:

> the amounts of light incident upon the subject photoelectric transducer comprise an amount of incident light when no light is incident upon the solid-state imaging device (see column 8, lines 12-17) and another amount of incident light which brings the solid-state imaging device to a near-overflow state (see column 8, lines 1-12).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levine in view of Heller and further in view of Contini (U.S. Patent No. 6,184,529).

Claim 5 may be treated like claim 1. However, Levine is silent with regard to using a defocused optical system for calibration.

Contini discloses a uniformity correction apparatus for an imaging system. As stated in column 2, lines 42-48, an advantage to using a defocused optical device when calibrating an imaging device is that a uniform photon flux may be cast upon the imaging device without needing a perfectly uniform illumination device. For this reason, it would have been obvious at the time of invention to have Levine include a defocused optical system, such as the one described by Contini.

Allowable Subject Matter

9. Claims 4, 6, and 9-19 are allowed.

Regarding claims 4, 6, 9, and 18, no prior art could be located that teaches or fairly suggests a pixel defect detector for a solid-state imaging device that determines coefficients a and b for the given Expression (1) using neighboring pixels and compares the coefficients with predetermined levels, wherein specific amounts of incident light are not required in the equation and the output of the equation is used to determine the presence/absence of a defect of a subject photoelectric transducer.

Regarding claims 10, 11, and 19, no prior art could be located that teaches or fairly suggests a pixel defect detector that sets a coefficient in the given equation to a median of the outputs of a specific set of photoelectric transducers.

Regarding claims 12-17, no prior art could be located that teaches or fairly suggests an image sensor calibration system that detects defective pixels using the given equations.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Whipkey, whose telephone number is (703) 305-1819. The examiner can normally be reached Monday through Friday from 8:30 A.M. to 6:00 P.M. eastern standard time, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber, can be reached on (703) 305-4929. The fax phone number for the organization where this application is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JTW
January 7, 2005

WENDY R. GARBER
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